Public Notice CENPS-OP-TS-NS-96

CENPS-OP-TS **8 July 1996**

MEMORANDUM FOR RECORD

SUBJECT: DETERMINATION OF THE SUITABILITY OF DREDGED MATERIAL TESTED UNDER PSDDA EVALUATION PROCEDURES FOR USACE KENMORE MAINTENANCE DREDGING FOR DISPOSAL AT THE PSDDA ELLIOTT BAY OPEN WATER DISPOSAL SITE.

1. The Corps of Engineers proposes to clamshell maintenance dredge approximately 60,000 cubic yards of sediment in the Kenmore Navigation Channel in Lake Washington. The federal Kenmore Navigation Channel project is sponsored by King County. The following summary reflects the PSDDA agencies' (Corps of Engineers, Department of Ecology, Department of Natural Resources and the Environmental Protection Agency) consensus decision on the acceptability of the sampling plan and all relevant test data to make a determination of suitability for the disposal of the material at the Elliott Bay open-water disposal site.

2. This project was ranked "high," based on guidance provided in the Management Plan Report, Phase II, Page A-10. This project is located in an area of known sources of contamination.

3. A sampling and analysis plan was completed for this project and approved by the PSDDA agencies on 18 January 1996. Sampling for this project was initiated on 21 February 1996. Recency for this project will expire 21 February 1998. Due to the limited dredging periods available in Lake Washington, the PSDDA agencies have agreed that this deadline may be extended to July 1998, barring any changes in conditions at the site.

SAP Approval Date	18 January 1996
Sampling dates	21-22 February 1996
Data Report submittal date	24 May 1996
Recency determination dates	21 February 1998

4. Fifteen Dredged Material Management Units were characterized. All DMMUs were surface units. Each sample represented one DMMU and approximately 4,000 cubic yards. Because this maintenance project is near the entrance to Kenmore Marina, one sample, S-4, was analyzed for tributyltin in addition to the standard PSDDA chemicals of concern.

5. For three DMMU the chemistry data indicated exceedances of the Dredging Year 1996 PSDDA screening levels. For sample S-1, the screening level was exceeded for acenapthene, anthracene, fluorene, and phenanthrene. (Chemical values are listed in Table 1.) For sample S-4,

the screening level for tributyltin was exceeded. For sample S-10, the screening level for DDT and DDE were exceeded. No bioaccumulation triggers or maximum levels were exceeded.

6. Due to the exceedance of chemical screening levels, biological testing was required for samples S-1, S-4, and S-10. The amphipod 10-day acute toxicity test, and the bivalve sediment larval combined mortality and abnormality (effective mortality) test, and the *Neanthes* 20-day growth test were conducted. In addition, both the saline extract and solid phase Microtox tests were performed. Use of the Microtox test has been suspended for regulatory decision-making, and the results of these tests are provided for information. Tests were conducted according to the guidelines specified by PSEP (1995), as modified by the PSDDA program.

7. Reference sediment for use in the bioassays was collected from Carr Inlet. Control sediment was collected from West Beach. *Eohaustorius estuarius* was used for the amphipod test due to the freshwater sediments. *Dendraster excentricus* was used for the sediment larval test.

8. Bioassay results are listed in Table 4. No DMMU showed hits in the amphipod test. For the echinoderm test, hits were exhibited for samples S-4 and S-10. These same two samples had hits on the Neanthes and saline microtox tests.

9. Two reference sediments were used, Carr4 and Carr20, to represent the grain-size distribution in the test sediments. Both echinoderm reference sediments failed to meet the quality control limit of 35%. In addition, there was high within replicate variability, especially for Carr4. In these cases a statistical power analysis is required to determine the acceptability of reference sediment results. The power analysis, using Borenstein and Cohen's statistical program, showed that a comparison of S4 to Carr4 had a power of 0.2. In contrast, a comparison of S4 to Carr20 had a power of 0.99. The PSDDA program requires statistical power of 0.6 for the reference sediment value to be considered valid. Therefore, Carr4 was rejected for the echinoderm test, and Carr20 was used for comparison.

10. In summary, PSDDA approved protocols and procedures were followed, and quality assurance/quality control guidelines specified in PSDDA were generally complied with. The data gathered were deemed sufficient and acceptable for regulatory decision-making under the PSDDA program. Based on the results of the chemical and biological testing, both DMMUs S-4 and S-10 (8,000 cubic yards) are not suitable for open-water disposal. The remaining volume (52,000 cubic yards) is suitable for disposal at the Elliott Bay open-water disposal site.

10. This memorandum documents the suitability of proposed dredged sediments for disposal at a PSDDA open-water disposal site. This determination of suitability does not preclude the consideration of this material for an appropriate beneficial use. It does not constitute final agency approval of the project. A dredging plan for this project must be completed as part of the final projet approval process. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under section 404 (b)1 of the Clean Water Act.

Re: DY97 Kenmore O&M Dredging

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Table 2. Sediment Conventional Parameters

DMMU	Volume	Grain-Size				Total Solids (%)	Total Volatile Solids(%)	Total Organic Carbon (%)	Bulk Ammonia (mg/kg)	Total Sulfides (mg/kg)
		Gravel	Sand	Silt	Clay					
S-1	4000	15	45.6	33.6	5.8	59	5.5	3.7	64	12
S-2	4000	21.1	61.0	16.3	1.6	70.7	2.9	1.5	24	4.4
S-3	4000	18.1	35.8	36.6	9.5	73	3.0	1.2	42	9.6
S-4	4000	3.6	57.8	32.3	6.3	64.2	4.4	2.1	75	9.8
S-5	4000	1	77.6	21.2	1.2	55.3	5.5	3.5	8.3	4.9
S-6	4000	1.7	62.5	34.1	1.7	43.8	7.9	3.6	87	66
S-7	4000	0.6	37.3	48.3	13.8	52.4	5.4	2.6	130	44
S-8	4000	1.4	42.4	45.5	10,7	35.4	13.1	4.1	130	82
S-9	4000	1.1	59.0	36.9	3.0	45.6	9.4	4.0	220	68
S-10	4000	0	29.5	65.1	5.4	34.2	13	5.3	280	91
S-11	4000	0.4	43.5	46.3	9.8	44	11.3	4.4	270	86
S-12	4000	0.9	46.4	48.3	4.4	31.5	12.1	6.2	100	67
S-13	4000	0	28.9	53.7	17.4	45	7.0	3.7	200	58
S-14	4000	0.6	41.3	48.1	10	56.8	5.0	4.4	130	13
S-15	4000	1.0	39.6	49.2	10.2	59.2	4.0	1.6	73	49

Table 3. Screening Level Exceedances

Parameters	Chemical Guidelines			S-1	S-4	S-10
	SL	BT	ML			
tributyltin (μg/kg)	30	228			74	
anthracene (μg/kg)	130		1300	170		
acenaphthene (μg/kg)	63		630	68		
fluorene (μg/kg)	64		640	86		
phenanthrene (μg/kg)	320		3200	330		
total DDT (μg/kg)	6.9	50	69			9.8

Table 4. Bioassay Results

DMMU	Amphipod *(E. Estuarius)* Mortality (%)	Sediment Larval Test *(Dendraster excentricus)* (Effective mortality %)	20 Day *Neanthes* Mean Growth Rate	Suitability for Non-Dispersive Disposal
Control	0		0.92	NA
Carr4	3.0	31.7[+]	0.88	NA
Carr20	2.0	17.9	1.04	NA
S-1	13	35.1	0.71	Pass
S-4	9.0	61.8*	0.47*	Fail
S-10	3.0	82.1*	0.70*	Fail
Positive Control (EC50/LC50) Lab Performance DAIS mean	Cd (mg/L) 2.2	CdCl (mg/L) 5.78 10.1 ± 6.5 mg/L Cd	Cd (mg/L) 7.22 6.18 ± 1.95 mg/L Cd 12.5 ± 5.4 mg/L Cd	NA

[+]rejected
* two-hit failure

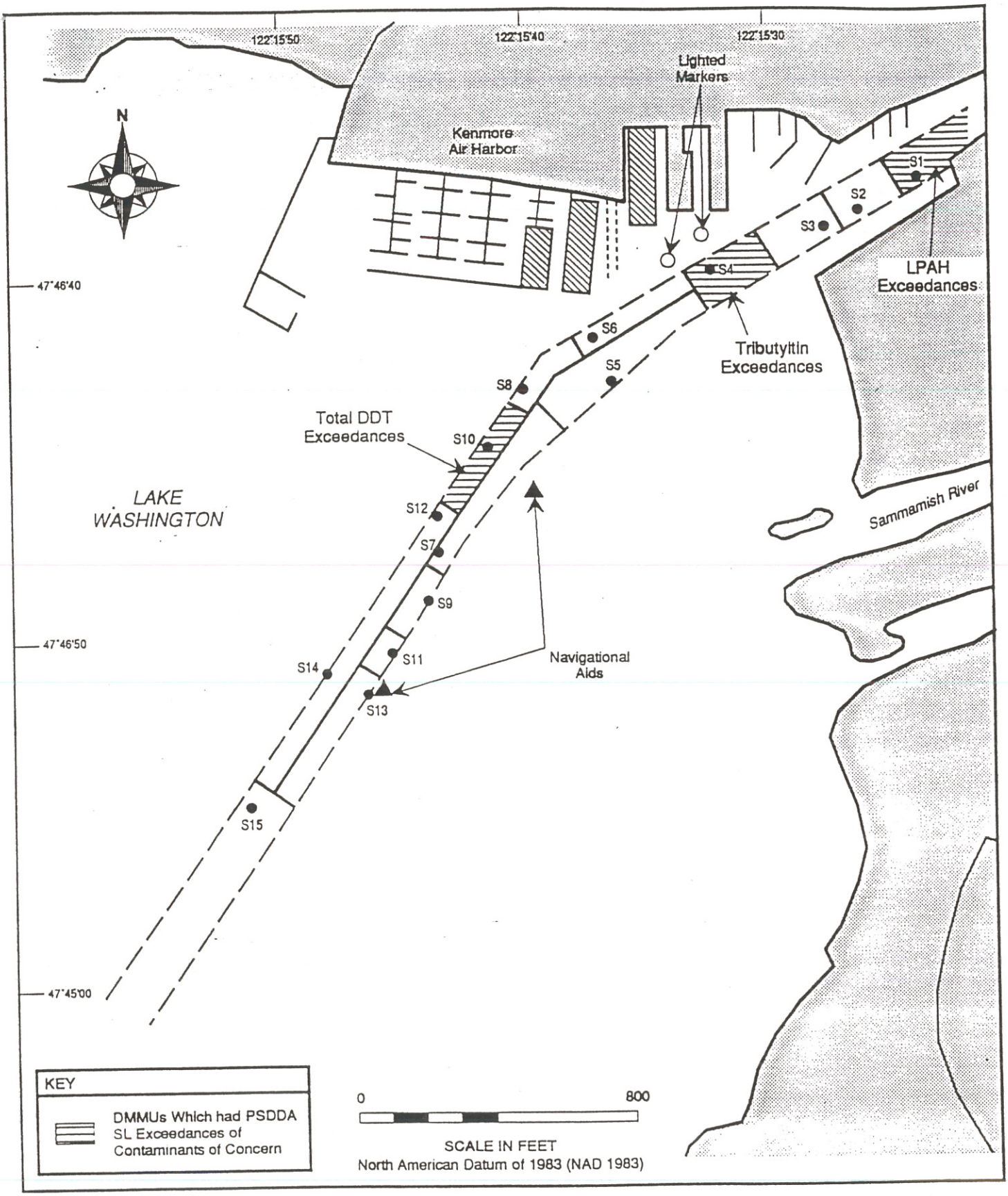

Figure 3-1. Locations of stations and corresponding DMMUs for which one or more contaminants exceeded PSDDA screening levels.